that the verification to which I subsequently submitted that star (B.A.C. 5457) leaves no doubt as to the legitimacy of the identification. But I wish especially to remark that amongst the published orbits is one in which the observations at Algiers have had no part; it is that calculated by Chandler on the observations of July 16, 21, and 28." M. Trépied suggests that the conjecture of Prof. Weiss as to the nature of the orbit rested not only on the differences in the mean place, but on the agreement of his own elements with those of Chandler. We are now aware, however, as was mentioned last week, that the apparent deviation from parabolic motion was caused by error in the position published for the night of discovery, and that M. Trépied's observations (the comparison star having been identified) prove very exact. The doubt we expressed was occasioned by the large corrections given in the circular of the *Astronomische Nachrichten*.

BRORSEN'S COMET OF SHORT PERIOD.—The following positions of this comet are deduced upon the same assumption with respect to the epoch of perihelion passage as those lately given for the period of absence of moonlight in August :—

12h. G.M.T.	R.A.	Decl.	Distance from Earth	Distance from Sun
	h. m.	° ′		
Sept. 15	10 26·6	+13 37	1·416	0·590
17	10 40·0	13 28	1·436	0·593
19	10 53·3	13 15	1·455	0·598
21	11 6·3	12 58	1·475	0·606
23	11 19·1	12 37	1·496	0·617
25	11 31·7	+12 12	1·518	0·630

An acceleration of four days in the time of arrival at perihelion would cause the following differences in the comet's geocentric position :—

		m.		′
On Sept. 15	In R.A.	+16·9	In Decl.	+31
,, 23	,,	+15·3	,,	+ 1

The intensity of light on September 15 is 1·43, and the comet would rise about 2h. 8m. before the sun. It should be sought for as soon as the moon is off the morning sky.

M. Trépied writes on August 26 that he had commenced a search for the comet according to the places given in NATURE. "Malheureusement," he says, "à Algers le temps qui peut être consacré à la recherche est très-court, car le crépuscule arrive presque immédiatement. Néanmoins je n'ai pas encore perdu tout espoir."

THE CAPE HELIOMETER.—The Treasury have granted Dr. Gill's application for a heliometer of large size for the Royal Observatory at the Cape of Good Hope, and a contract has been entered into with the Messrs. Repsold of Hamburg. The instrument will be of seven inches aperture, and is to be completed by the end of 1886, at an expense of 2700*l*.

SCIENTIFIC SERIALS

The American Journal of Science, August 1884.—Contributions to meteorology: reduction of barometric observations to sea-level (continued), by Prof. Elias Loomis. The author considers that it is quite useless to seek for a formula exactly representing the barometric reduction to sea-level at all pressures and temperatures, unless the irregular movements in the upper and lower strata of the atmosphere be taken into account. But these movements are greatly modified by the obstruction of the mountains upon which the observations are made, and therefore vary with the locality; hence he concludes that such an attempt seems a hopeless undertaking.—Notes on the rock and ore-deposits in the vicinity of Notre Dame Bay in Newfoundland, by M. E. Wadsworth. The districts examined were chiefly various points between Exploits Burnt Island and Betts Cove, which yielded basalt, diorite, porodite, andesite (?), porphyrite, and argillite, variously impregnated with chalcopyrite, malachite, and copper. But none of the ores were found associated with serpentine, which was nowhere seen except in small quantity at Betts Cove.—On the origin of bitumens, by S. F. Peckham. The author deals with the views of those who regard bitumens (asphalt, naphtha, petroleum, &c.) either as indigenous to the rocks in which they are found, as the product of chemical action, or as a distillate produced by natural causes. He is on the whole inclined to regard these substances as distillations from animal and vegetable organic remains, and argues that if they were the result of a purely chemical process we should not expect to find Palæozoic petroleums of a composition corresponding with the simple animal and vegetable organisms that flourished at that period, and Tertiary petroleums containing nitrogen unstable, and corresponding with the decomposition-products of more highly organised beings; but we should expect to find a general uniformity in the character of the substance wherever found all over the earth. On the other hand, if petroleum is the product of metamorphism, its formation is coexistent only with that of metamorphic action, which does not seem to have prevailed on a large scale during recent geological periods. Hence on this hypothesis its production must be considered as practically ended.—On the measurement of rapidly alternating electric currents with the galvanometer, by L. M. Cheesman.—Note on some specimens of nickel ore from Churchill County, Nevada, by Spencer B. Newberry. The analysis of these samples gave :—

NiO	33·71 per cent.
As_2O_2	36·44 ,,
H_2O	24·77 ,,

From the extraordinary purity and richness of these ores, the author considers it probable that the Nevada mines, which run 6000 feet north-east and south-west to the Carson Desert, will eventually become a chief source of the world's supply of this valuable metal.—On the formation of gorges and waterfalls, by W. Morris Davis. The author considers that, although the Colorado Cañon, the greatest gorge in the world, was formed by rapid downward erosion following the rapid elevation of the plateau, most falls and ravines result from the local displacement of streams by blockades of glacial drift, or by temporary obstruction from the glacial sheet itself.—On the influence of light on the electrical resistances of metals, by Arthur E. Bostwick. From a series of experiments with various metals, the author concludes that, if light causes any diminution in the electrical resistance of metals, it probably does not exceed a few thousandths of one per cent.—Note on the rare mineral vanadinite occurring in the Black Prince Mine, Pinal County, Arizona, by Francis Hayes Blake.—Remarks on the united metatarsal bones of the Ceratosaurus, an already described new Dinosaurian, by Prof. O. C. Marsh. The author points out that all known adult birds, living and extinct, with perhaps the single exception of Archæopteryx, have the tarsal bones firmly united, whereas all the Dinosauria, except Ceratosaurus, have these bones separate. The exception in each case brings the two classes near together at this point, and their close affinity has now been clearly demonstrated.

Bulletin de l'Académie Royale de Belgique, May 1884.—Observations on the shooting-stars made at the Royal Observatory of Brussels on August 9–11, 1883, by L. Niesten.—Description of the effects of a stroke of lightning on the new Palace of Justice, Brussels.—Memoir on the process of segmentation in the Ascidians, and its relations with the organisation of the larvæ (two plates), by Edouard van Beneden and Charles Julin.—Some arithmetical theorems, by E. Catalan.—Researches on the absolute power of the muscles in the invertebrates, second part: absolute power of the flexor muscles of the pinchers in the decapod crustaceans (one plate), by Felix Plateau.—Exact dates of the birth and death of Wenceslas Coebergher, by Auguste Castan.—Essay on freedom of conscience in Athens, by M. A. Wagener.—Theories of Plato and Aristotle on the social question, by Ch. Loomans.—Memoir on the best means of improving the moral, intellectual, and physical state of the working classes, by Joseph Danby.

SOCIETIES AND ACADEMIES

SYDNEY

Royal Society of New South Wales, July 2.—H. C. Russell, B.A., F.R.A.S., President, in the chair.—Six new members were elected, fifty-four donations received, and the following papers read:—Notes on gold, viz. (1) a remarkable occurrence of nearly pure gold in Queensland, being 99·7 of gold, the rest copper, with a trace of iron, found in quartz and stalactites of brown hæmatite; (2) preparation of pure gold; (3) volatilisation of gold, by A. Leibius, Ph.D., M.A.—Notes on minerals new to New South Wales, by Prof. Liversidge, F.R.S., accompanied by specimens. Remarkable concretions of friable iron pyrites containing septa of quartz, resembling in appearance the well-known "septaria" of the London Clay, large crystals of axinite, idocrase in association with grossularite from Nundle, tourmaline in large prisms resembling the celebrated Bovey Tracey forms, Scheelite, molybdenum ochre, antimonite containing native gold from near Armidale, and allophane, serving as a

matrix for native copper, Blayney.—On the oven-mounds of the aborigines in Victoria, by the Rev. Peter MacPherson, M.A. The situations, sizes, and structure (internal and external) of these aboriginal relics were considered, and measurements given. The cooking oven, or smaller portion of the mound, was specially investigated. Besides the more common contents, namely, ashes, charcoal, and stones, human remains were sometimes found. Where no timber existed, a kind of turf and coarse grass were used as fuel. Circles of stones girdling the mound were described. So far as appeared, no very high antiquity was required to account for the mounds.—Mr. W. Neill exhibited some very rich specimens of gold in quartz and mispickel from the new mine Wahaup, East Ballarat.

PARIS

Academy of Sciences, August 25.—M. Rolland, President, in the chair.—Remarks on aërial navigation, in connection with the experimental trip made on August 9 by Capts. Renard and Krebs with their new balloon, by M. Dupuy de Lome. The author regards the experiment as so far highly satisfactory, and announces that it will be soon renewed with a screw machine possessing double the motive power of the first, and calculated to travel in any direction with an average speed of fifteen miles an hour. It is further pointed out that the balloon is constructed on the principles expounded in a memoir addressed by the author to the Academy of Sciences and dated February 2, 1872.—Contributions to the study of algebraic equations: (1) general considerations, binomial and trinomial equations, by M. de Jonquières.—On the process of cold-hammering, and the variation in the limit of elasticity in metals and other solid substances, by M. Tresca.—Researches in organic botany; studies on the formation and presence of nitrates in plants; methods of analysis, by MM. Berthelot and G. André. An account is here given of the authors' attempt at a complete analysis of a vegetable organism with a view to determining the chemical equation during its development from the fertilised germ to its fructification and reproduction. Experiments were also made for the purpose of varying the physiological conditions of vegetable growth, and for these various objects ten botanical species, including six varieties of the Amaranthus were subjected to a methodical and comparative study during the season of 1883.—Note on astronomical measurements and especially on the choice of a common meridian, by M. A. d'Abbadie. The author pronounces in favour of the west coast of Flores, one of the Azores, for the chief meridian, or else for its anti-meridian, should the latter be preferred. He also proposes the adoption of a unit of 10,000 kilometres for the measurement of celestial spaces, this unit to be called a *mégiste* (*μέγιστον*).—A study of the sphincters of the cardiac and other veins, with remarks on their hermetic occlusion during the presystole state, by M. P. Durozicz.—Note on the inequality in the distribution of the solar temperature according to latitude and the activity of the photosphere, by P. Lamey.—Observations of the new planet Palisa 239 made at the Paris Observatory (equatorial of the West Tower), by M. G. Bigourdan.—Observations of the Barnard comet and of the new planet Palisa 238, by M. Perrotin.—Remarks on the universal hour, and on the formula—

Universal time = local time + (12h. + longitude),

where the longitude is reckoned eastwards from 0h. to 24h., by M. Caspari.—Description of a thermo-regulator of simple construction intended also to serve as a registering thermometer (two illustrations), by M. E. H. von Baumhauer.—Researches on the infra-red spectra of emission of metallic vapours, by M. Henri Becquerel. The paper is accompanied by a table of the wave-lengths of the most intense rays, bands, or groups of rays characterising the spectra of the vapours of potassium, sodium, strontium, calcium, zinc, aluminium, cadmium, lead, silver, tin, and some other metals.—Determination of the indices of refraction by linear measurements, by M. Ch. V. Zenger.—On the quality of the various farinas obtained by different processes of grinding, by M. Aimé Girard.—Note on the poisonous properties of urea, determined by a series of experiments made on frogs, guinea-pigs, rabbits, and pigeons, by MM. Gréhant and Quinquaud. The experiments consisted in subcutaneous injections of aqueous solutions of pure urea, the doses being gradually increased, and invariably terminating in tetanic convulsions and death. The convulsions resembled those produced by strychnine, and were followed by death in the course of from one to ten hours.—Remarks on the action of high pressure on the phenomena of putrefaction and on the vitality of minute organisms in fresh and salt water, by M. A. Certes. The object of M. Certes' studies was to determine the processes and the conditions under which organic matter is reduced to the inorganic state at the bottom of the sea. Experiments were also incidentally made with the bacteria of charbon, which preserved their vitality and virulence under a pressure of 600 atmospheres, maintained for a period of twenty-four hours.—Remarks on the action of lesions of the rachidian bulb on the digestive functions, by MM. Couty, Guimaraes, and Niobey.—Experiments made to determine the loss of nitrogen during the fermentation of farmyard manure, by M. Ch. Brame.—On the dehiscence of the anthers in phanerogamous plants, by M. Leclerc du Sablon.—Report on the present state of the Krakatoa volcano, by MM. Bréon and Korthals. The report embodies an account not only of Krakatoa, but also of all the surrounding districts, which were wasted by the eruption of August 26, 1883. Some successful photographs were taken, including the only exact profiles hitherto obtained of Krakatoa.

VIENNA

Imperial Academy of Sciences, June 19.—R. Herth, researches on hemialbumose or propeptone.—R. Scharitzer, on the minerals and rocks of Jan Mayen.—F. Bayer, on the extremities of a young Hætteria.—K. Natterer, on the opposition of hydric chloride to dichlorocrotonaldehyde.—L. Tausch, on some Conchylia from the fauna of Lake Tanganyika (Central Africa), and their allied fossils.

July 3.—E. Marenzeller, on Southern Japanese Annelids; description of species of the genera Ampharetea, Terebellacea, Subellacea, and Serpulacea.—F. Bertolasi, on the applicability of Wittstein's and Kinkelin's formulæ to volumetric calculations.—S. Bernheimer, contribution to a knowledge of the nerve-fibre layer of the human retina.—A. Nalepa, preliminary communication on the anatomy of Tyroglypha.—T. Habermann, on acetonhydroquinone.—T. Zehenter, on the action of phenol and sulphuric acid on hippuric acid.—E. von Oppolzer, determination of the length of the pendulum at the Vienna Observatory.—M. Pernter, contribuions to a knowledge of the winds in the upper strata of the air.

July 10.—T. Lerch, researches on chelidonic acid.—A. Lieben and A. Haitinger, on chelidonic acid.—F. Spitzer and T. Kachler, on camphoronic acid.—H. Molisch, on aërotropism of roots.—E. von Oppolzer, determination of the force of gravity while using two Repsold's pendulums of different weights.

CONTENTS